

**EJERCICIOS FRACCIONES ALGEBRAICAS    Ficha 2**

1) Simplifica:

a) 
$$\frac{x^4 - 2x^3 - 3x^2}{x^4 - 9x^2}$$

b) 
$$\frac{x^3 - 3x^2 + 3x - 1}{x^3 - 2x^2 + x}$$

c) 
$$\frac{x^3 - x^2 - 2x}{x^3 - 3x^2 + 2x}$$

2) Efectúa las siguientes operaciones y simplifica:

a) 
$$\left( \frac{2x-1}{x+1} - \frac{3x}{x-1} \right) \cdot \left( \frac{x^3-x}{-x^2-6x+1} \right)$$

b) 
$$\frac{2x}{x-2} + \frac{3x-1}{x+2} - \frac{1}{x^2-4}$$

c) 
$$\frac{1}{(x-1)^2} + \frac{2}{x-1} + \frac{1}{x^2-1}$$

SOLUCIONES

1.-

a) 
$$\frac{x^4 - 2x^3 - 3x^2}{x^4 - 9x^2} = \frac{x^2(x^2 - 2x - 3)}{x^2(x^2 - 9)} = \frac{x^2(x-3)(x+1)}{x^2(x-3)(x+3)} = \frac{x+1}{x+3}$$

b) 
$$\frac{x^3 - 3x^2 + 3x - 1}{x^3 - 2x^2 + x} = \frac{(x-1)^3}{x(x-1)} = \frac{x-1}{x}$$

c) 
$$\frac{x^3 - x^2 - 2x}{x^3 - 3x^2 + 2x} = \frac{x(x^2 - x - 2)}{x(x^2 - 3x + 2)} = \frac{x(x-3)(x+1)}{x(x-2)(x-1)} = \frac{x+1}{x-1}$$

2.-

a) 
$$\left( \frac{2x-1}{x+1} - \frac{3x}{x-1} \right) \left( \frac{x^2-x}{-x^2-6x+1} \right) = \frac{(2x-1)(x-1) - 3x(x+1)}{(x+1)(x-1)} \cdot \frac{x^3-x}{-x^2-6x+1} =$$
  

$$= \frac{2x^2 - 2x - x + 1 - 3x^2 - 3x}{(x+1)(x-1)} \cdot \frac{x(x-1)(x+1)}{-x^2-6x+1} =$$
  

$$= \frac{-x^2 - 6x + 1}{(x+1)(x-1)} \cdot \frac{x(x-1)(x+1)}{-x^2-6x+1} = x$$

b) 
$$\frac{2x}{x-2} + \frac{3x-1}{x+2} - \frac{1}{x^2-4} = \frac{2x(x+2)}{x^2-4} - \frac{(3x-1)(x-2)}{x^2-4} - \frac{1}{x^2-4} =$$
  

$$\frac{2x^2 + 4x - 3x^2 + 6x + x - 2 - 1}{x^2-4} = \frac{-x^2 + 11x - 3}{x^2-4}$$

c)

$$\frac{1}{(x-1)^2} + \frac{2}{x-1} + \frac{1}{x^2-1} = \frac{1}{(x-1)^2} + \frac{2}{(x-1)} + \frac{1}{(x-1)(x+1)} =$$
  

$$= \frac{x+1+2(x^2-1)+(x-1)}{(x-1)^2(x+1)} = \frac{x+1+2x^2-2+x-1}{(x-1)^2(x+1)} = \frac{2x^2+2x-2}{(x-1)^2(x+1)}$$